

at line 26, delete "predictively" and insert therefor --predictably--.

On Page 85, at line 34, delete " _____ [108-059PCT000]" and insert therefor --99/49411--.

On Page 86, at line 15, after "environment" insert --,--.

On Page 90, at line 6, delete "thana" and insert therefor --than a--;
at line 20, delete "read by by" and insert therefor --read by--; and
at line 22, delete "cooridinales" and insert therefor --coordinates--.

On Page 91, at line 18, delete "thana" and insert therefor --than a--.

On Page 92, at line 8, delete "read by by" and insert therefor --read by--;
at line 9, delete "cooridinales" and insert therefor --coordinates--;
at line 19, delete "There of course" and insert therefor --There, of course,--; and
at line 25, delete "structure" and insert therefor --structures--.

AMENDMENT OF THE CLAIMS TO INVENTION:

Claims 4-80 have been amended as follows:

4. (Amended) An automated package identification and measuring system, wherein the LADAR-based imaging, detecting and dimensioning subsystem produces a synchronized amplitude-modulated laser beam that is automatically scanned across the width of the conveyor belt structure and, during each scan thereacross, detects and processes the reflected laser beam in order to capture a row of raw range (and optionally reflection-intensity) information that is referenced with respect to a polar-type coordinate system symbolically-embedded within the [LASAR-based] LADAR-based imaging, detecting and dimensioning subsystem.

5. (Amended) An automated unitary-type package identification and measuring system (i.e. contained within a single housing or enclosure), wherein a scanning [subsytem] subsystem is used to read bar codes on packages entering the system, while a package dimensioning subsystem is used to capture information about the package prior to entry into the tunnel.

6. (Amended) An automated package identification and measuring system, wherein Laser Detecting And Ranging (LADAR-based) scanning methods are used to capture two-dimensional range data maps of the space above a conveyor belt structure, and two-dimensional image contour tracing methods are used to extract package dimension data therefrom.

7. (Amended) A unitary system, in which the scanning subsystem can be realized using either a holographic scanning mechanism, a 1D or 2D camera system or polygonal scanning mechanism.

8. (Amended) A unitary system, in which the package velocity is computed by using a pair of laser beams projected [at] at different angular projections over the conveyor belt.

9. (Amended) The unitary system in which the laser scanning lasers beams having multiple wavelengths to sensing packages [having] have a wide range of reflectivity characteristics.

10. (Amended) A system and method, in which the same amplitude modulated laser beam used to dimension packages is also used to detect the presence of packages over a prespecified time interval.

11. (Amended) A system and method, wherein an omni-directional laser scanning tunnel is used to read bar codes on packages entering the tunnel, while a package dimensioning subsystem is used to capture information about the package prior to entry into the tunnel.

12. (Amended) A package identification and measuring system, wherein Laser Detecting And Ranging (LADAR-based) scanning methods are used to capture two-dimensional range data maps of the space above a conveyor belt structure, and two-dimensional image contour tracing methods are used to extract package dimension data therefrom.

13. (Amended) A package identification and measuring system, [wherein the] comprising a package dimensioning subsystem [is] realized as a LADAR-based package imaging and dimensioning unit (i.e. subsystem) supported above the conveyor belt structure of the system.

14. (Amended) [A] The package identification and measuring system of Claim 13, wherein [the] a LADAR-based imaging, detecting and dimensioning subsystem produces a synchronized amplitude-modulated laser beam that is automatically scanned across the width of the conveyor belt structure and, during each scan thereacross, detects and processes the reflected laser beam in order to capture a row of raw range (and optionally reflection-intensity) information that is referenced with respect to a polar-type coordinate system symbolically-embedded within the LADAR-based imaging, detecting and dimensioning subsystem.

15. (Amended) [A] The package identification and measuring subsystem of Claim 14, wherein the rows of range data captured by the LADAR-based imaging, detecting and dimensioning subsystem are continuously loaded into a preprocessing data buffer, one row at a time, and processed in real-

time using window-type convolution kernels that smooth and edge-detect the raw range data and thus improve its quality for subsequent dimension data extraction operations.

16. (Amended) [A] The package identification and measuring subsystem of Claim 14, wherein [the] a LADAR-based imaging, detecting and dimensioning subsystem automatically subtracts detected background information (including noise) from the continuously updated range data map as to accommodate for changing environmental conditions and enable high system performance independent of background lighting conditions.

17. (Amended) [A] The package identification and measuring subsystem of Claim 14, wherein [the] a LADAR-based imaging, detecting and dimensioning subsystem automatically buffers consecutively captured rows of smoothed/edge-detected range data to provide a range data map of the space above the conveyor belt, and employs two-dimensional image contour tracing techniques to detect image contours within the buffered range data map, indicative of packages being transported through the laser scanning tunnel system.

18. (Amended) [A] The package identification and measuring subsystem of Claim 17, wherein [the] a LADAR-based imaging, detecting and dimensioning subsystem automatically processes the indices (m,n) of the computed contours in order to detect vertices associated with polygonal-shaped objects extracted from the range data map, which are representative of packages or like objects being transported through the laser scanning tunnel system.

19. (Amended) [A] The package identification and measuring subsystem of Claim 18, wherein the LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of the detected vertices associated with the computed contours in order to detect candidates for corner points associated with the corners of a particular package being transported through the laser scanning tunnel system.

20. (Amended) [A] The package identification and measuring subsystem of Claim 19, wherein the LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of detected corner point candidates in order to reduce those corner point candidates down to those most likely to be the corners of a regular-shaped polygonal object (e.g. six sided box).

21. (Amended) [A] The package identification and measuring subsystem of Claim 20, wherein the LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n

indices of the corner points extracted from the range data map in order to compute the surface area of the package represented by the contours traced therein.

22. (Amended) [A] The package identification and measuring subsystem of Claim 21, wherein the LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of the corner points extracted from the range data map in order to compute the x,y and z coordinates corresponding to the corners of the package represented by the contours traced therein, referenced relative to a Cartesian-type global coordinate reference system symbolically embedded within the automated package identification and measuring subsystem.

23. (Amended) [A] The package identification and measuring subsystem of Claim 21, wherein the LADAR-based imaging, detecting and dimensioning subsystem automatically processes the m and n indices of the corner points extracted from the range data map in order to compute the average height of the package represented by the contours traced therein, referenced relative to the Cartesian-type global coordinate reference system.

24. (Amended) [A] The package identification and measuring subsystem of Claim 13, wherein the LADAR-based imaging, detecting and dimensioning subsystem employs a polygonal-type laser scanning mechanism for scanning an amplitude-modulated laser beam across the width of the conveyor belt.

25. (Amended) [A] The package identification and measuring subsystem of Claim 13, wherein the LADAR-based imaging, detecting and dimensioning subsystem employs a holographic-type laser scanning mechanism for scanning an amplitude-modulated laser beam across the width of the conveyor belt.

26. (Amended) [A] The package identification and measuring system of Claim 13, wherein mathematical models are created on a real-time basis for both the geometry of the package and the position of the laser scanning beam used to read the bar code symbol thereon.

27. (Amended) [A] The package identification and measuring system of Claim 26, wherein the mathematical models are analyzed to determine if collected and queued package identification data is spatially and/or temporally correlated with package measurement data using vector-based ray-tracing methods, homogeneous transformations, and object-oriented decision logic so as to enable simultaneous tracking of multiple packages being transported through the scanning tunnel.

28. (Amended) A package identification and measuring system, in which a plurality of holographic laser scanning subsystems are mounted from a scanner support framework, arranged about a high-speed conveyor belt, and arranged so that each scanning subsystem projects a highly-defined 3-D omni-directional scanning volume with a large depth-of-field, above the conveyor structure so as to collectively provide omni-directional scanning with each of the three principal scanning planes of the tunnel-type scanning system.

29. (Amended) [A] The package identification and measuring system of Claim 28, wherein singulated packages can be detected, dimensioned, weighed, and identified in a fully automated manner without human intervention, while being transported through a laser scanning tunnel subsystem using a package conveyor subsystem.

30. (Amended) [A] The system of Claim 29, wherein a package detection and dimensioning subsystem is provided on the input side of its scanning tunnel subsystem, for detecting and dimensioning singulated packages passing through the package detection and dimensioning subsystem.

31. (Amended) [A] The system of Claim 30, wherein a data element queuing, handling and processing subsystem is provided for queuing, handling and processing data elements representative of package identification, dimensions and/or weight, and wherein a moving package tracking queue is maintained so that data elements comprising objects, representative of detected packages entering the scanning tunnel, can be tracked along with dimensional and measurement data collected on such detected packages.

32. (Amended) [A] The system of Claim 31, wherein a package detection subsystem is provided on the output side of its scanning tunnel subsystem.

33. (Amended) A system[, wherein the] including a tunnel scanning subsystem [provided therein] which comprises a plurality of laser scanning subsystems, and each such laser scanning subsystem is capable of automatically generating, for each bar code symbol read by the subsystem, accurate information indicative of the precise point of origin of the laser scanning beam and its optical path to the read bar code symbol, as well as produced symbol character data representative of the read bar code symbol.

34. (Amended) [A] The system of Claim 33, wherein the plurality of laser scanning subsystems generated an omnidirectional laser scanning pattern within a 3-D scanning volume, wherein a bar code symbol applied to any one side of a six-sided package (e.g. box) will be automatically scanned and decoded when passed through the 3-D scanning volume using the conveyor subsystem.

35. (Amended) [A] The system of Claim 34, wherein the laser scanning subsystems comprise holographic laser scanning subsystems, and also polygonal-type laser scanning subsystems for reading bar code symbols facing the conveyor surface.

36. (Amended) [A] The system of Claim 35, wherein each holographic laser scanning subsystem employed in the tunnel scanning subsystem comprises a device for generating information specifying which holographic scanning facet or holographic facet sector (or segment) produced the laser scan data used to read any bar code symbol by the subsystem.

37. (Amended) [A] The system of Claim 34, wherein each non-holographic (e.g. polygonal-type and CCD camera type) laser scanning subsystem employed in the tunnel scanning subsystem comprises a device for generating information specifying which mirror facet or mirror sector produced the laser scan data used to read any bar code symbol by the subsystem.

38. (Amended) [A] The system of Claim 34 which further comprises a, wherein the] data element queuing, handling and processing subsystem [provided therein further comprises] having a scan beam geometry modeling subsystem for producing, relative to a local coordinate reference system symbolically embedded within the laser scanning subsystem, coordinate information comprising a geometric model of each laser scanning beam used to read a particular bar code symbol for which symbol character data has been produced by the laser scanning subsystem.

39. (Amended) [A] The system of Claim 38, wherein the data element queuing, handling and processing subsystem [provided therein] further comprises a first homogeneous transformation module for converting the coordinate information comprising the geometric model of each laser scanning beam used to read a particular bar code symbol on a detected package, from the local coordinate reference system symbolically embedded within the laser scanning subsystem, to a global coordinate reference system symbolically embedded within the tunnel-type scanning system.

40. (Amended) [A] The system of Claim 39, wherein the data element queuing, handling and processing subsystem [provided therein] further comprises a package surface modeling subsystem for

producing, relative to a local coordinate reference system symbolically embedded within the laser scanning subsystem, coordinate information comprising a geometric model of each surface on each package detected by the package detection and dimensioning subsystem.

41. (Amended) [A] The system of Claim 39, wherein the data element queuing, handling and processing subsystem [provided therein] further comprises a second homogeneous transformation module for converting the coordinate information comprising the geometric model of each surface on a detected package, from the local coordinate reference system symbolically embedded within the laser scanning subsystem, to a global coordinate reference system symbolically embedded within the tunnel-type scanning system.

42. (Amended) [A] The system of Claim 40, wherein a laser scan beam and package surface intersection determination subsystem is provided for determining which detected package was scanned by the laser scanning beam that read a particular bar code symbol, and for linking (i.e. correlating) package measurement data associated with the detected package with package identification data associated with the laser scanning beam that read a bar code symbol on a detected package.

43. (Amended) A system [with] for identifying and dimensioning packages comprising:

a laser scanning tunnel subsystem;

a package detection and dimensioning subsystem; and

a package velocity measurement subsystem for measuring the velocity of the package as it moves from the package detection and dimensioning subsystem through the laser scanning tunnel subsystem of the system.

44. (Amended) [A] The system of Claim 43, wherein the package velocity measurement subsystem is realized as an integral part of the LADAR-based imaging, detecting and dimensioning subsystem.

45. (Amended) [A] The system of Claim 43, wherein a package weighing-in-motion subsystem is provided for weighing singulated packages moving through the package detection and dimensioning subsystem, and producing weight measurement information for assignment to each detected package.

46. (Amended) [A package identification and measuring] The system of Claim 43, wherein singulated packages can be detected, dimensioned, weighed, and identified in a fully automated manner without

human intervention, while being transported through a laser scanning tunnel subsystem using a package conveyor subsystem.

47. (Amended) [Another object of the present invention is to provide such a] The system of Claim 43, wherein the tunnel scanning subsystem [provided therein] comprises a plurality of laser scanning subsystems, and each such laser scanning subsystem is capable of automatically generating, for each bar code symbol read by the subsystem, accurate information indicative of the precise point of origin of the laser scanning beam and its optical path to the read the bar code symbol, as well as symbol character data representative of the read bar code symbol.

48. (Amended) [Another object of the present invention is to provide such a] The system of Claim 43, wherein [the] a data element queuing, handling and processing subsystem is provided therein [further] comprises a scan beam geometry modeling subsystem for producing, relative to a local coordinate reference system symbolically embedded within the laser scanning subsystem, coordinate information comprising a geometric model of each laser scanning beam used to read a particular bar code symbol for which symbol character data has been produced by the laser scanning subsystem.

49. (Amended) [Another object of the present invention is to provide such a] The system of Claim 48, wherein the data element queuing, handling and processing subsystem provided therein further comprises a first homogeneous transformation module for converting the coordinate information comprising the geometric model of each laser scanning beam used to read a particular bar code symbol on a detected package, from the local coordinate reference system symbolically embedded within the laser scanning subsystem, to a global coordinate reference system symbolically embedded within the tunnel-type scanning system.

50. (Amended) [Another object of the present invention is to provide such a] The system of Claim 48, wherein the data element queuing, handling and processing subsystem provided therein further comprises a package surface modeling subsystem for producing, relative to a local coordinate reference system symbolically embedded within the laser scanning subsystem, coordinate information comprising a geometric model of each surface on each package detected by the package detection and dimensioning subsystem.

51. (Amended) [Another object of the present invention is to provide such a] The system of Claim 49, wherein the data element queuing, handling and processing subsystem provided therein further comprises a second homogeneous transformation module for converting the coordinate information

comprising the geometric model of each surface on a detected package, from the local coordinate reference system symbolically embedded within the laser scanning subsystem, to a global coordinate reference system symbolically embedded within the tunnel-type scanning system.

52. (Amended) [Another object of the present invention is to provide such a] The system of Claim 50, wherein a laser scan beam and package surface intersection determination subsystem is provided for determining which detected package was scanned by the laser scanning beam that read a particular bar code symbol, and for linking (i.e. correlating) package measurement data associated with the detected package with package identification data associated with the laser scanning beam that read a bar code symbol on a detected package.

53. (Amended) [Another object of the present invention is to provide such a] The system of Claim 43, which comprises [with] a package velocity measurement subsystem for measuring the velocity of the package as it moves from the package detection and dimensioning subsystem through the laser scanning tunnel subsystem of the system.

54. (Amended) [Another object of the present invention is to provide such a] The system of Claim 43, wherein the package detection and dimensioning subsystem provided on the input side of the laser scanning tunnel subsystem comprises a laser scanning mechanism that generates an amplitude modulated laser scanning beam that is scanned across the width of the conveyor structure in the package conveyor subsystem while the scanning beam is disposed substantially perpendicular to the surface of the conveyor structure, and light reflected from scanned packages is collected, detected and processed to produce information representative of the package height profile across the width of the conveyor structure for each timing sampling instant carried out by the package detection and dimension subsystem.

55. (Amended) [Another object of the present invention is to provide a] The system of Claim 54, wherein said laser scanning mechanism comprises LADAR-based package imaging, detecting and dimensioning subsystem for imaging and/or profiling packages transported thereby a substantially constant velocity.[.]

56. (Amended) [Another object of the present invention is to provide such a] A LADAR-based imaging, detecting and dimensioning subsystem, wherein a synchronized amplitude-modulated laser beam is automatically produced and scanned across the width of a conveyor belt structure and, during each scan thereacross, detects and processes the reflected laser beam in order to capture a row of raw

range (and optionally reflection-intensity) information that is referenced with respect to a polar-type coordinate system symbolically-embedded within the [LASAR] LADAR-based imaging, detecting and dimensioning subsystem.

57. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 56, wherein captured rows of range data are continuously loaded into a preprocessing data buffer, one row at a time, and processed in real-time using window-type convolution kernels that smooth and edge-detect the raw range data and thus improve its quality for subsequent dimension data extraction operations.

58. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 56, wherein detected background information (including noise) is automatically subtracted from consecutively captured rows of smoothed/edge-detected range data to provide a range data map of the space above the conveyor belt, for use in carrying out package dimension data extraction operations involving the same.

59. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 57, wherein two-dimensional image contour tracing techniques are used to detect image contours within the buffered range data map, indicative of packages being transported thereby.

60. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 59, which automatically processes the indices (m,n) of the computed contours in order to detect possible vertices associated with polygonal-shaped objects extracted from the range data map, which are representative of packages or like objects being transported by the subsystem.

61. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 60, wherein the m and n indices of the vertices associated with the computed contours are automatically processed in order to detect candidates for corner points associated with the corners of packages transported by the subsystem.

62. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 61, wherein the m and n indices of detected

corner point candidates are automatically processed in order to reduce those corner point candidates down to those most likely to be the corners of a regular-shaped polygonal object (e.g. six sided box).

63. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 62, wherein the m and n indices of the corner points extracted from the range data map are automatically processed in order to compute the surface area of the package represented by the contours traced therein.

64. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 63, wherein the m and n indices of the corner points extracted from the range data map are automatically processed in order to compute the x,y and z coordinates corresponding to the corners of the package represented by the contours traced therein, referenced relative to a Cartesian-type global coordinate reference system symbolically embedded within the automated package identification and measuring subsystem.

65. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 63, wherein the m and n indices of the corner points extracted from the range data map are automatically processed in order to compute the average height of the package represented by the contours traced therein, referenced relative to the Cartesian-type global coordinate reference system.

66. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 56, wherein a polygonal-type laser scanning mechanism is used to scan an amplitude-modulated laser beam across the width of the conveyor belt.

67. (Amended) [Another object of the present invention is to provide such a] The LADAR-based imaging, detecting and dimensioning subsystem of Claim 56, wherein a holographic-type laser scanning mechanism is used to scan an amplitude-modulated laser beam across the width of the conveyor belt.

68. (Amended) A dual-beam LADAR-based imaging, detecting and dimensioning subsystem integrated within the housing of a unitary package identification and dimensioning system.

69. (Amended) [A] The dual-beam LADAR-based imaging, detecting and dimensioning subsystem of Claim 68 comprising retro-reflective beam-steering mirrors for mounting on opposite sides of a conveyor belt.

70. (Amended) A dual-beam LADAR-based imaging, detecting and dimensioning subsystem [of the present invention], comprising:

a subsystem housing;

[an] a multi-sided polygonal scanning element, mounted on an optical bench [within the subsystem housing], for generating a pair of amplitude modulated laser beams [(from a pair of laser beam production modules)] which are projected along a pair of spaced-apart scanning planes through a light transmission aperture formed in the subsystem housing,

____ a light collecting mirror mounted on the optical bench for collecting reflected laser light off a scanned object [(e.g. package)] and focusing the same to a focal point located on the surface of a stationary planar mirror mounted on the optical bench, and [an avalanche-type]

____ a photodetector mounted on the optical bench for detecting laser light focused onto the stationary planar mirror and producing an electrical signal corresponding thereto, signal processing circuitry for processing the produced electrical signal and generating raw digital range data representative of the distance from the polygonal scanning element to sampled points along the scanned object [(as well digital scan data representative of any bar code symbol the scanned surface of the object)], and

a programmed digital image data processor for preprocessing the raw digital range data and removing background information components, and for processing the preprocessed range data so as to extract therefrom information regarding the dimensions (e.g. area, height, length, width and vertices) of the scanned object and produce data representative thereof as well as the velocity of the dimensioned package.

71. (Amended) A dual-beam LADAR-based imaging, detecting and dimensioning subsystem comprising:

[means] a mechanism for producing a [pari] pair of laser scanning beams for projection through a holographic spatial filter causing a plurality of modulated laser beams to be simultaneously projected over [the] a conveyor belt surface at different angular spacings to achieve a desired degree of spatial sampling of the conveyor belt surface and objects transported therealong, while a rotating eight-sided polygon scanning element is used to create a moving field of view (FOV) across the illuminated conveyor belt.

72. (Amended) A dual-beam LADAR-based imaging, detecting and dimensioning subsystem comprising:

a holographic scanning disc, rotatably mounted on an optical bench within the subsystem housing, for generating a pair of amplitude modulated laser beams having multi-wavelengths [(produced from a pair of laser beam production module)] and projected along a pair of spaced-apart scanning planes [(along multiple depths of focus)] through a light transmission aperture formed in the subsystem housing[.];

___ a parabolic light collecting mirror mounted beneath the holographic scanning disc for collecting reflected laser light off a scanned object [(e.g. package)] and focusing the same to [an avalanche-type] a photodetector mounted above the scanning disc, and producing an electrical signal corresponding thereto;

signal processing circuitry for processing the produced electrical signal and generating raw digital range data representative of the distance from the polygonal scanning element to sampled points along the scanned object [(as well digital scan data representative of any bar code symbol the scanned surface of the object).]; and

a programmed digital image data processor for preprocessing the raw digital range data and removing background information components, and for processing the preprocessed range data so as to extract therefrom information regarding the dimensions (e.g. area, height, length, width and vertices) of the scanned object and produce data representative thereof as well as the velocity of the dimensioned package.

73. (Amended) A dual-beam LADAR-based subsystem comprising:

a mechanism for generating a pair of laser scanning for projection perpendicular to the surface of a conveyor belt along the entire length thereof, using a cylindrical-type focusing element ([i.e.] e.g. cylindrical holographic optical element HOE).

74. (Amended) A package-in-the-tunnel (PITT) indication subsystem comprising:

a LADAR-based imaging, detecting and dimensioning subsystem, wherein the extreme portion of one of the amplitude modulated (AM) laser scanning beams produced by said LADAR-based imaging, detecting and dimensioning subsystem is used to generate an object sensing beam is reflected across the width of the conveyor belt of the system, is reflected off a mirror on the opposite side of the conveyor belt, and is detected at a prespecified "time window" and processed in effort to detect the presence or absence of packages being transported along the conveyor belt.

75. (Amended) A method of package (i.e. object) detection along a conveyor belt using a portion of the amplitude-modulated laser scanning beam generated by [the] a LADAR-based imaging, detecting, and dimensioning subsystem [of the present invention] .

76. (Amended) A method of deriving from a selected portion of a AM laser scanning beam generated by [the] a LADAR-based subsystem [of the present invention], and a time-windowed portion of which is digitally processed by a FIR-type digital filter so as to compute a first derivative signal thereof which is then compared against threshold values to determine whether or not a package is present or absent from the conveyor belt over the time period (i.e. time window) of interest[.].

77. (Amended) A LADAR-based imaging, detecting and dimensioning subsystem comprising:
____ a start-of-object-sensing cycle (SOSC) pulse generation circuit;
____ a LADAR-based photo-detection circuit; an analog object detection circuit; and
____ controller circuit with object detection window signal generation capabilities.

78. (Amended) The system [above] of Claim 77, wherein said analog object detection circuit performs a first derivative function on the analog intensity varying object sensing signal over a prespecified/controlled time period (i.e. time-window), and thresholds the first derivative signal to determine whether or not an package is present or absent from the conveyor belt over the time-window and generates a digital output signal to indicate the state of such determinations.

79. (Amended) A tunnel-type laser scanning package identification and weighing system [comprising] comprising:

a [high speed] conveyor [belt] structure for conveying packages;

a LADAR-based imaging, detecting and dimensioning subsystem mounted above said conveyor structure; [AND] and

[AN] an automatic bar code symbol reading system mounted above said conveyor structure employing a 1-D (i.e. linear) CCD-based scanning array below which a light focusing lens is mounted for imaging bar coded packages transported therebeneath and decode processing to read such bar code symbols in a fully automated manner without human intervention.

80. (Amended) An automated tunnel-type laser scanning package identification and weighing system comprising:

a [high speed] conveyor [belt] structure for conveying packages;

a LADAR-based package imaging, detecting and dimensioning subsystem disposed above said conveyor structure,

a low-resolution CCD camera [to locate] mounted above said conveyor structure for locating the x,y position of labels on scanned packages;

an automatic bar code symbol reading system mounted above said conveyor structure and comprising a stationarily[—]mounted light focusing lens mounted below a vertically-translatable 2-D CCD-based high-resolution scanning array controlled by package height information obtained from [the] said LADAR-based package imaging, detecting and dimensioning subsystem; and

a pair of orthogonally-mounted field-of-view (FOV) steerable mirrors mounted beneath [the] said 2-D CCD-based scanning array and controlled by [the] said x,y coordinates collected by the low-resolution CCD camera, so as to scan detected package labels, collect high-resolution scan data therefrom, and decode processing the same so as to read bar code symbols within the detected package label in a fully automated manner without human intervention.